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The term "sustainable development" describes certain proposals designed to provide the present generation with such needs as food, shelter, and energy while sustaining the environment or stock of natural resources for future generations. The purpose of this paper was to analyze the relationship between sustainable development and current U.S. petroleum policy.

Information was gathered from newspapers, journals, government publications, and other relevant literature. The paper provided an overview of sustainable development, a history of U.S. petroleum policy, and an analysis of the congruence of sustainable development and current U.S. petroleum policy.

The analysis showed that U.S. petroeleum policy does

not reflect the tenets of sustainable development. The paper examined three factors, other than the structure of America's government and decision-making process, that mmight explain the discrepancy between sustainable development and U.S. petroleum policy. These factors were widespread political inaction among Americans, negative interpretations of sustainable development, and a similarity between the intentions underlying both sustainable development and the problems it seeks to solve. The paper closed with some general speculations about sustainable development.

An Analysis of the Relationship Between Sustainable Development and U.S. Petroleum Policy

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"Nowadays we no longer know what is going to happen tomorrow in our world, and this causes us a secret joy; because that very impossibility of foresight, that horizon ever open to all contingencies, constitute authentic life, the true fullness of our existence."

-Jose Ortega y Gasset

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AN ANALYSIS OF THE RELATIONSHIP BETWEEN SUSTAINABLE DEVELOPMENT AND U.S. PETROLEUM POLICY

INTRODUCTION

This paper examines selected aspects of the issue of sustainable development. In its most general sense, sustainable development is a process in which the present generation's needs (e.g., food, shelter, energy) are provided while the environment or stock of natural resources is sustained for future generations. The concept originated in the United Nations in the 1960s and has become prominent as a central feature of that organization's development and environmental philosophy, World Bank programs, Europe's Green Party platform, and environmental associations such as the World Resources Institute. (Batie, 1989)

Sustainable development strategies seek to address the challenges facing the earth's life support systems. These challenges include air and water pollution, extinction of plant and animal species, and possible global warming.

Virtually all versions of sustainable development take a global perspective, recognizing that some forms of environmental stress, such as stratospheric ozone depletion, threaten people in many nations and that, given the world's massive and interdependent population, "the integration of

environment and development is required in all countries, rich and poor.... No country can develop in isolation from others." (WCED, 1987)

Because this paper is concerned with prospects for sustainable development in the United States, I will limit my discussion to this country, except where otherwise indicated, realizing that a concerted international effort and not action by one or a few countries in isolation, would likely be needed to bring into being the society and environment envisioned by adherents of sustainable development.

The purpose of this paper is to determine the extent to which sustainable development ideology is reflected in current U.S. petroleum policy and to suggest some explanations for the relationship between sustainable development and policy. Section One will provide an overview of sustainable development and present two versions of the concept for the purpose of policy evaluation. Section Two will examine U.S. petroleum policy. Section Three will propose some explanations for the discrepancy between sustainable development and U.S. policy.

I will argue that at least three factors, apart from the structure and decision-making process of the American government, may account for the government's failure to aggressively or even actively pursure a sustainable development agenda. These factors are: 1) widespread

political inaction among Americans; 2) negative interpretations of sustainable development; and 3) a similarity in the intentions underlying both sustainable development and many of the problems it seeks to solve. I will elaborate on these ideas in Section Three.

SECTION ONE: SUSTAINABLE DEVELOPMENT

I What is Sustainable Development?

Sandra S. Batie notes a significant obstacle to discussions of sustainable development: "the concept of sustainable development is amorphous - it is perceived differently by different people." (Batie, 1989) As such, the phrase could be used by anyone with a regimen to preserve the world's long-term health. A general definition comes from the United Nations' World Commission on Environment and Development (WCED): "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (WCED, 1987) Other definitions range in comprehensiveness from economist David Pearce's requirement for "at least a constant stock of natural capital, construed as the set of all environmental assets" (Pearce, 1988) to a Costa Rican group's vision of "a way of life based on individual and group responsibility, social justice, and peaceful civil and international relations." (Quesada-Mateo, 1990)

Sustainable development concepts do share some fundamental goals, an examination of which will provide an overview of the subject. Sustainable development advocates believe that the achievement of these goals is crucial to the establishment of a sustainable relationship between

human activity and the natural world. These goals can be paraphrased as: 1) protection of the environment; 2) a more equitable distribution of resources among members of the current generation as well as between the current and future generations; 3) technology that is environmentally safe and directed toward the provision of social goods; and 4) changes in government attitudes, objectives, and institutional arrangements that facilitate the integration of economic and ecological concerns in decision making. (WCED, 1987) I will discuss each of these goals separately.

1. Environmental Protection

All life on earth ultimately depends on the integrity of ecological systems. Mankind's knowledge of these systems is still imperfect. Aldo Leopold, like advocates of sustainable development, believed that this partial ignorance meant that people should treat the environment with caution and respect. "The land is one organism.... Only those who know most about it can appreciate how little is known about it. The last word in ignorance is the man who says of an animal or plant 'What good is it?'" (Leopold, 1949) Sustainable development seeks to respect the interdependence and balance of the environment. Sustainable development strategies focus on maintaining the flexibility of social and natural systems through conserving environmental options. Destroying a species or an area of

land's regenerative capacity forecloses environmental options and jeopardizes the integrity of the total system. Some specific methods of environmental preservation are outlined below along with suggested implementations of that accord with sustainable development ideology.

Environmental Protection Method	Example
Decrease pollution.	Enforce stricter standards for industrial emissions of hazardous substances.
Minimize waste of resources.	Make buildings and products more energy efficient.
Protect species and their habitat.	Establish more wilderness areas in national forests.
Minimize management of natural systems.	Reverse human actions causing declines in wild fish populations rather than add hatchery fish to rivers.
Make land use sensitive to an area's natural attributes.	Do not plant crop requiring significant irrigation or establish large communities on arid land.

Sustainable development calls for recognition of the fact that the biosphere can only assimilate so much pollution before being damaged, perhaps irrevocably, and that extinction of biological resources leads to a "diminution and instability to the quality of life." (Batie, 1989) Hence, preserving the environment or enhancing it by discontinuing damaging practices is a central tenet of sustainable development. It should be noted that

sustainable development does not advocate the conservation of nature in its original state as a primary goal. "It implies, instead, a pattern of development minimizing (or reversing) the degradation or destruction of the ecological basis of production and habitability." (Quesada-Mateo, 1990)

2. Intra- and Intergenerational Equity

Sustainable development calls for a more equitable distribution of resources among members of the current generation as well as between current and future generations. This call for equity is not grounded in moral concepts of justice so much as in the desire for environmental protection. In many countries, especially in the Third World, people living in extreme poverty must cut scarce timber for fuel, cultivate marginal land, and otherwise damage the environment in order to survive. It is believed that a more equitable distribution of wealth and resources would relieve this poverty and preclude the environmental damage associated with it. (WCED, 1987)

The need for a more even distribution of resources or wealth within nations is not particularly evident in the United States, although 1990 Census Bureau figures did show that "inequality in the distribution of income has increased substantially in the last two decades." (Pear, 1990) Industrialized nations such as the U.S. figure more prominently in the issue of distribution of resources among

nations. The U.S. consumes a very large proportion of some resources. For example, America accounts for only five percent of the world's population but consumes about 25 percent of the world's annual oil production. (NYT, 1/17/91) The WCED notes that "Living standards that go beyond the basic minimum are sustainable only if consumption standards everywhere have regard for long-term sustainability." (WCED, 1987) Sustainable development requires a more responsible use of resources by industrialized nations as well as an increase in the standard of living in developing countries. (WCED, 1987)

In industrialized nations, sustainable development calls for new policies that will "reduce per capita consumption and encourage a shift to non-polluting sources [of energy] and technologies." (WCED, 1987) For developing nations, a duplication of the consumption patterns of industrialized countries is not considered feasible or desirable. Instead, sustainable development recommends increased international cooperation in the form of monetary aid, trade agreements, and information exchanges that can make poor nations more self-sufficient and, by raising the per capita income of their citizens, reduce the damage caused by people who must pressure natural resources to meet their daily needs. A higher average standard of living in the Third World might also ease population rates there by reducing the incentive to have many children to contribute to household income and provide a form of social security

for members of the family who have become too old to work. Diversification of the economies of developing countries is considered one of the best ways to raise per capita income in developing countries. (Quesada-Mateo, 1990) Many Third World nations rely heavily of a few export commodities, such as coffee or cocoa, which makes them vulnerable to crop failures and price declines in international markets. Also, land use devoted to export crops on a very large scale "impoverishes many people and can increase pressures on the natural resource base through overcommercialized agriculture and through the marginalization of subsistence farmers." (WCED, 1987)

Lower levels of consumption in industrialized nations and a mitigation of the poverty in developing countries that leads to environmental stress are viewed by sustainable development advocates as a foundation for intergenerational equity. This concept implies that the current generation "must not compromise the ability of future generations to meet their 'material needs' and to enjoy a healthy environment." (Batie, 1989) If the current generation treats the environment properly, future generations should inherit a healthy world with adequate resources. However, sustainable development does not assume that equity across generations will follow automatically from intragenerational equity. The idea of responsibility to our descendants must be a factor in all types of decision making. (WCED, 1987) Talbot Page notes that "the costs of long-lived material

wastes or material resource depletion are not certainties or even mathematical expectations. The burdens associated with resource use that we are placing upon the future are largely risk burdens." (Page, 1977) Sustainable development seeks to minimize those risk burdens by discouraging the processes that create hazardous wastes and by maintaining the ecological viability of the resource base.

3. A Reorientation of Technology

The billions of people on earth could not co-exist without technology's complex network of machinery and the results of scientific activity, such as medicine. While acknowledging mankind's reliance on technology, many sustainable development advocates view it with suspicion. "Science and technology are seen more as problem-creating than problem-solving." (Batie, 1989) Nuclear waste is a good example of a problem created by technology. While many people assume that technology will be developed to solve the world's energy problems, there is no guarantee that this will happen. No one has yet discovered a way to make nuclear waste inert; currently, radioactive material is "disposed of" by burying it underneath rocks. (LWV, 1985) Sustainable development's view of technology recognizes both its fallability as a <u>deus ex machina</u> and that "every new technology, even those designed to correct the problems of

earlier technologies, brings unforeseen consequences." (Norgaard, 1988)

Sustainable development calls not for the elimination of technology but for a reorientation of it. According to the WCED, "Most technological research...is devoted to product and process innovations that have market value. Technologies are needed that produce 'social goods,' such as improved air quality or increased product life...." (WCED, 1987) Technology must also be "appropriate" under sustainable development; that is, "not harmful to the environment - 'it fits within the biophysical and socioeconomic parameters of the environment on which it is imposed' - and is respectful of and does not dominate the needs of the local population, their culture, and their natural environment." (Batie, 1989) The WCED recommends formation of "national and international institutional mechanisms to assess potential impacts of new technologies before they are widely used, in order to ensure that their production, use, and disposal do not overstress environmental resources." (WCED, 1987) Sustainable development would also encourage a shift away from scientific research in highly specialized subjects to investigation of the interaction and interdependence of natural systems.

4. Changes in Policy Decision Making

Sustainable development calls for a sincere commitment to integrate economic and environmental considerations in decision making. One obstacle to this goal in current institutional arrangements is "the tendency to deal with one industry or sector in isolation, failing to recognize the importance of intersectoral linkages." (WCED, 1987) Thus, sustainable development requires that institutions cooperate in framing objectives and take into account the repercussions that activities within their own sectors may have in other areas. Richard Norgaard predicts that in an era dedicated to achieving sustainable development, "Good policy makers will be those who can lead enlightening conversations between scientists with different disciplinary backgrounds and between people of different cultures and knowledges. These conversations may lead to a common understanding but will be effective whenever they simply reduce single-minded intransigence." (Norgaard, 1988)

Sustainable development would probably entail greater government intervention in America's economic system which, being based on competition, does not promote equity or environmental preservation to the extent deemed necessary by sustainable development advocates. Tougher environmental laws wold probably be forthcoming, such as the phase-out of chlorofluorocarbons mandated by the 1990 amendments to the Clean Air Act. (Schneider, 1990) More significantly,

environmental objectives would be integrated into all phases of development policy, not just addressed in legislation to mitigate ongoing ecological damage or clean up problems that already exist. Major changes in America's economic system to promote sustainable development would probably entail revised definitions of progress. For example, an increase in GNP might not be considered progress unless it was accompanied by reductions in national energy use or pollution levels.

Sustainable development would also require greater cooperation at the international level, given such problems as global warming which would not acknowledge national boundaries. The achievement of greater resource equity among countries would probably require an increased presence of the Third World in decision making since "it is not easily conceivable that advanced countries would spontaneously take the initiative of introducing major changes [that would significantly aid poor nations]." (Gallopin, 1989)

II The Extreme Views

In the preceding pages I presented a general picture of sustainable development. I will further clarify the concept by analyzing the views that bracket sustainable development at either end of the spectrum of ideology regarding the earth's future.

1. Cornucopians

People known as "cornucopians" find reason to believe that the quality of life and of the environment will continue to improve in the foreseeable future. Economist Julian Simon supports this view by citing positive trends in life expectancy, pollution abatement, food production, and the ratio of wealth generated to hours worked. (Simon, 1989) Cornucopians believe that human ingenuity is an inestimatable asset that will devise technology and/or substitiutes to solve natural resource problems. The cornucopian view can be summarized as: "the world has been moving along a trajectory of increasing enrichment and, taking into account the potential of the new techno-economic revolution, the prospects for the future look even better." (Gallopin, 1989)

Cornucopians believe that the pervasive, significant changes in political and economic objectives and environmental management that sustainable development entails are unnecessary because economic and quality-of-life trends are positive and there is "no persuasive reason to believe that these trends will not continue indefinitely." (Simon, 1989) They advocate a laissez-faire government that allows human creativity to continue devising new technological means to substitute or more effectively use resources and raise the standard of living. Cornucopians would reject sustainable development policies as not only

unnecessary but potentially harmful because such policies would curtail the implementation of some types of technology and might modify the goals of research.

2. Deep Ecology

Advocates of the deep ecology movement believe that piecemeal attempts to solve environmental problems within existing socio-political frameworks are ineffectual. They believe a fundamental change in human consciousness is needed to replace "the idea of progress through technical mastery of nature [which] has been central to Western culture for several centuries." (Norgaard, 1988) This new understanding would reject the anthropocentric idea that nature exists to serve man in favor of the idea that all living creatures and natural systems have intrinsic value and a right to exist undisturbed by humans except to supply the most basic needs. Human beings are merely one part of the natural community rather than its ruler, under this view. Deep ecologists believe that human population and productions have usurped too much of the earth. They think that no truly sustainable environmental balance will be achieved unless human population drops significantly, much of the world's development is dismantled, and a new value system assigning man a more modest role in the natural world becomes the basis for decision making.

Deep ecology views sustainable development as an ineffectual attempt to solve social/environmental problems by tinkering with existing institutions and practives while perpetuating the anthropocentric ideas that have given rise to current problems. (Sessions, 1985) Sustainable development does hold the continued existence of human civilization as a predominant goal and primarily views environmental preservation as a means to this end rather than an end in itself. Deep ecologists believe that the future of mankind and the environment will be in jeopardy as long as such anthropocentric ideas prevail.

III The Neoclassical Economic Paradigm

Sustainable development is a paradigm for economic analysis and resource use. As such, it conflicts in several important respects with the current dominant paradigm in American economics, the neoclassical paradigm. (Batie, 1990) I will briefly describe the main points of the neoclassical paradigm and then describe how sustainable development argues against these points. It is important to understand the tension between the two concepts because, in order to be successful, sustainable development will probably have to supplant the neoclassical model. The two concepts differ so significantly in their fundamental premises that their integration or functional co-existence is unlikely.

Generally speaking, the neoclassical economic paradigm comprises the following assumptions:

* Resource scarcity is relative, not absolute, because technology can provide substitutes.

* Price changes are the best guide for the allocation of resources because rising prices for scarce resources will spur development of substitutes.

* Values emanate from individuals' preferences and are expressed by willingness to pay. Discrepancies in ability to pay are disregarded.

* Progress is measured in quantitative terms such as GNP. The model acknowledges no limit to growth.

* Economic systems are mechanistic, capable of moving forward and backward along a continuum. This implies that actions are reversible.

* Pollution can be controlled through market adjustments such as fees.

The economic model assumes that resource scarcity is only relative because technology can provide substitutes. Sustainable development challenges the belief that

technology can always provide alternatives for natural resources. New technology may not be discovered, may create new problems, or may be hard to implement in a timely, predictable fashion. The neoclassical paradigm also assumes that prices are the best allocator of resources because rising prices for dwindling resources should encourage development of substitutes. Sustainable development does not advocate relying on prices alone as a guide to resource use. Because prices do not reflect externalities, or secondary consequences of the production process such as pollution, prices may encourage resource use that has harmful ecological effects. Irreversible environmental damage may occur long before prices rise high enough to make substitutes economically attractive. This may be the case with petroleum products, as discussed in Section Two of this paper.

Sustainable development does not hold that values are merely reflections of individuals' preferences, evinced by willingness to pay. The concept of sustainable development implies that a commitment to environmental protection and responsibility to future generations are values with special importance. Sustainable development's emphasis on improving the condition of the poor and encouraging wealthy nations to discipline their resource consumption does not fit with the neoclassical paradigm's implication that the preferences of people able to pay will predominate.

The economic model measures progress in quantitative terms such as GNP and acknowledges no limit to growth. (Batie, 1990) Sustainable development holds that the biosphere imposes absolute limits on economic growth, notably through "the limits of the assimilative capacity of the environment with respect to waste residuals from human activities." (Batie, 1990) Because sustainable development assumes that there are environmental limits to what mankind can safely do, its conception of progress is not necessarily best expressed by numbers such as GNP that hopefully get bigger each year. Sustainable development might measure progress in alternative forms such as improvement in environmental quality.

Sandra S. Batie also notes that the neoclassical paradigm abstracts from the natural world with a "mechanistic view of the world [that] results in neoclassical economists searching for optimal solutions, equilibrium positions, and reversible actions." (Batie, 1990) Sustainable development, on the other hand, views the world as a place subject to irreversibility, unstable systems, unpredictable systems changes, disequilibriums, and non-incremental events, and requiring an economic paradigm that acknowledges these attributes. While the neoclassical paradigm treats the environment and natural resources as static components of equations, sustainable development demands a more central role for the environment in economic

calculations and a realistic evaluation of the vulnerabilities and limits of the natural world.

The neoclassical paradigm's assumption that pollution can be controlled through market adjustments such as fees is the aspect of the model most reconcilable with sustainable development. There is not yet clear evidence to determine whether market adjustments could in fact eliminate the problems of pollution because appropriate fees have not been calculated or implemented on a wide scale. It might be very difficult to determine an "acceptable" level of pollution and appropriate fees because the cumulative and interactive effects of pollutants on the environment are not fully understood. What are considered safe levels of emissions now might suddenly prove to be too high in the future. In any case, sustainable development calls for a more comprehensive strategy than fees or incentives to address the problem of pollution. As far as they can be determined, the full ecological costs of pollution must be internalized in the production process. Such actions would probably entail new definitions of property rights for such common pool resources as air and rivers. Sustainable development policies would clearly establish the obligation of those who jeopardize the ecological health of common pool resources to minimize and repair the consequences of their actions. Furthermore, sustainable development holds that "environmental objectives must be built into taxation, prior approval procedures for investment and technology choice,

foreign trade incentives, and all components of development policy." (WCED, 1987)

IV Two Versions of Sustainable Development

A rigorous and standardized definition of sustainable development may emerge as discussions of the concept continue in coming years. Definitions of sustainable development currently range widely in terms of the practical, moral, and social concepts that they umbrella under the phrase. However, sustainable development concepts do involve some kind of modification of government institutions and socio-industrial processes to ensure that current and future generations can meet their needs within a healthy natural environment. It seems to me that the main factor that will influence formation of a more detailed, practical definition of sustainable development is the conflict between economic and environmental interests. The main point of contention will probably be the degree to which economic decisions will be influenced by environmental considerations. Because a widely accepted definition of sustainable development has not yet emerged, I will propose two versions of sustainable development for the purpose of policy analysis rather than overlook the tension between economic and environmental interests or anticipate the outcome of the debate by weighting one factor more heavily than the other within a single definition.

1. Economic Version

A sustainable development agenda stressing the importance of economic considerations would probably represent only a slight modification of existing institutions and methods. It would likely maintain the dominance of the neoclassical economic paradigm, since that model appears to be an accepted standard for economic efficiency, although two adjustments might be anticipated. The first change would be acknowledgment that environmental sustainability is a value warranting special consideration in economic equations because its importance is vital but not usually reflected in terms that the market system recognizes, such as willingness to pay. The second change would involve an attempt to redress the market's failure to account for externalities through market adjustments. Tax breaks for pollution abatement equipment or other types of incentives would probably become more common, as would emission quotas, fees, and the phasing-out of particularly harmful substances or practices. These changes would probably be gradual and otherwise made palatable to the business sector.

2. Environmental Version

A sustainable development agenda stressing the importance of environmental considerations would comprise

strategies more ambitious than just internalizing the environmental costs of production and development, although the elimination of externalities would be a high priority. Redistribution of resources to forestall environmental damage attributable to extreme poverty, reduced levels of resource consumption, phasing-out of the use of fossil fuels and nuclear power, stricter environmental standards for business and technology, and greater efforts to protect or restore the ecological integrity of the environment would be goals within a sustainable development framework oriented toward environmental protection. Because these efforts would represent new or at least intensified objectives for government and business, the structure and professed goals of public and private institutions would likely change significantly to reflect this environmental orientation.

V Summary of Section One

Sustainable development is a proposed method for ensuring that the current generation can meet its material needs while sustainaing a healthy environment and stock of natural resources for future generations. While definitions of the concept vary in comprehensiveness, they agree that at least four goals must be achieved if sustainable development is to succeed. These goals are protection of the environment, a more equitable distribution of resources, a reorientation of technology, and a better integration of

economic and environmental considerations in government and business decision making. Sustainable development ideology lies between the extreme views of cornucopians, who believe that technology will guarantee mankind a bright future, and deep ecologists, who believe that a positive future requires a fundamental shift in human thinking toward biocentrism. Sustainable development, other than the "economic" version that I set forth, conflicts with most tenets of America's dominant economic paradigm and will probably have to supplant that model if it is to be successful. Because a specific definition of sustainable development that addresses the tension between economic and environmental objectives has not yet emerged, I proposed two versions of the concept to be used for policy analysis. The version of sustainable development stressing economic considerations would merely grant environmental factors a premium in economic calculations and internalize the environmental costs of production through market adjustments. The environmental version of sustainable development would entail much more comprehensive strategies and significant changes in government and business institutions.

SECTION TWO: U.S. PETROLEUM POLICY

To analyze the congruence of U.S. policy and sustainable development, I will focus upon petroleum policy. I chose petroleum policy as a representative microcosm of U.S. policy because oil plays a significant role in virtually all sectors of the economy and affects virtually every American's standard of living. In Section Two, I will examine the relevance of petroleum to sustainable development and then present an overview of past and current U.S. petroleum policy. Finally, I will analyze this policy in terms of the two versions of sustainable development presented at the end of Section One.

I Petroleum and Sustainable Development

There are essentially three features of petroleum that make it relevant to the issue of sustainable development: 1) oil is a finite resource; 2) environmental problems result from oil spills and the burning of petroleum; and 3) the U.S. economy and military rely heavily on petroleum and petroleum products such as gasoline. I will expand each of these points separately.

1. A Finite Resource

Crude oil consists primarily of carbon and hydrogen atoms although other elements, such as sulphur or heavy metals, may be present in small amounts. (Jones, 1988) Crude oil is rarely used in its original state. Through refining, crude is converted into a range of fuels such as gasoline as well as fuel oils, petroleum coke, lubricants, solvents, and petrochemicals. Known world oil reserves are expected to last for about 50 years at current rates of consumption, although experts estimate that new oil discoveries should double that time frame. The Organization of Petroleum Exporting Countries (OPEC) controls over 75 percent of known reserves; the U.S. controls under three percent. (ODOE, 1991)

Oil represents about 40 percent of total U.S. energy consumption. Only about five percent of the oil used in the U.S. is utilized to generate electricity; approximately 65 percent is burned as fuel for transportation. (Schneider, 1991) Because the transportation sector accounts for the majority of petroleum consumption, it is likely that efforts to introduce substitutes for petroleum would concentrate on that sector.

In accordance with the neoclassical economic paradigm, rising prices for petroleum should spur development and implementation of substitutes. While this may be true, two other factors complicate the picture. Because exploring for

new oil reserves is expensive and prone to failure, companies only seek new fields aggressively if there is an outlook for high oil prices. (Jones, 1988) High oil prices also encourage the development of new extraction technology, such as horizontal drilling or injection wells, that can prolong the production life of established fields. Consequently, rising oil prices work to increase the supply of oil as well as make substitutes more economically attractive.

The most promising substitutes for gasoline are currently compressed natural gas, methanol, ethanol, liquified petroleum gas, and electricity. (ODOE, 1991) While the technology exists to build or convert vehicles to run on these alternative fuels, there are considerable obstacles to widespread fuel switching. These difficulties include producing the fuels, establishing re-fueling stations, manufacturing the vehicles, and affecting a significant portion of the approximately 145 million cars in the U.S. (Wald, 2/17/91) It will probably take several years for oil prices to stabilize at levels high enough to justify the expense of widespread fuel switching. It is estimated that oil prices would have to more than double from current levels of about $20 per barrel to about $45/barrel before widespread transportation fuel switching would begin to be economically feasible. (Chevron, 1991) The Oregon Department of Energy forecasts that crude oil

prices will not reach an average price level of $45/barrel before the year 2005. (ODOE, 1991)

2. Environmental Problems

There are basically three types of environmental problems associated with petroleum. These are contamination of water and marine ecosystems by oil spills, smog and other types of air pollution caused by burning petroleum, and the contribution to potential global warming caused by carbon dioxide (CO2) released through the burning of petroleum.

Discharges of crude oil into bodies of water can damage marine ecosystems, the extent of the harm being determined by the amount and composition of the oil spilled, the geographical attributes of the site, and the success of clean-up efforts. Oil spills can cause marine creatures such as sea birds, otters, and fish to die by asphyxiation, starvation, and poisoning. The worst oil spill in U.S. history occurred in 1989 when the Exxon tanker Valdez spilled 250,000 barrels or about 11 million gallons of crude into Alaska's Prince William Sound. The spill created an oil slick the size of Rhode Island "in the midst of one of the richest concentrations of animals in North America." (Shabecoff, 1989)

Most air pollution problems associated with petroleum result from emissions resulting from the burning of transportation fuels. Motor vehicles release significant

quantities of hydrocarbons, nitrogen oxides, volatile organic compounds, and carbon monoxide. These emissions interact with other components of the atmosphere to create smog and related air quality problems caused by ground-level ozone and carbon monoxide. (USDOE, 1991) In 1970, the Environmental Protection Agency established National Ambient Air Quality Standards (NAAQS) in an effort to protect human health and the environment. Many major cities fail to meet the NAAQS for carbon monoxide and ground-level ozone, chiefly because of automobile emissions and industrial activities involving the burning of oil. (USDOE, 1991)

According to the U.S. Department of Energy (DOE), despite large uncertainties regarding the existence and potential consequences of the greenhouse effect, "there is sufficient credible scientific concern to start acting to curb the buildup of so-called greenhouse gases - several of which are related to the production and use of energy." (USDOE, 1991) These gases include CO2 and carbon monoxide, which both result from the burning of petroleum products, especially gasoline. Greenhouse gases trap radiation from the sun within the earth's atmosphere. A 1990 study by the United Nations' Intergovernmental Panel on Climate Change predicted that the greenhouse effect could result in an increase of the global mean temperature of two degrees by 2025 and five degrees before the end of the next century. (IPCC, 1990) Scientists believe that such temperature increases could cause the sea level to rise and agricultural

belts to shift, among other effects. Carbon dioxide currently represents about 55 percent of the potential for warming (also known as radiative forcing) attributable to greenhouse gases. The energy sector is believed to have been responsible for about 57 percent of radiative forcing during the 1980s. (USDOE, 1991)

3. Relevance to the Economy

Virtually all sectors of the U.S. economy use petroleum or petrochemicals. The transportation sector is the biggest consumer, accounting for about two thirds of all petroleum used in this country. Petroleum is used as a fuel in industrial processes as well as a raw material in the production of plastics, textiles, pharmaceuticals, and other products. (Chevron, 1991) Military vehicles and aircraft are also largely dependent on petroleum. Consequently, oil and oil prices have great relevance to the country's economy. Since the mid-1980s, the amount of oil consumed in the U.S. has increased while domestic production has steadily declined. In 1990, the U.S. imported 42 percent of the oil it used at a cost of approximately $55 billion. (USDOE, 1991) This is a significant flow of money out of the country. High oil prices can impair the profitability and competitiveness of industries that rely on petroleum. Rising gasoline prices can also encourage inflation as

consumers seek wage increases to maintain their standard of living.

II Overview of U.S. Petroleum Policy

The U.S. petroleum industry and related policy measures can be roughly divided into three eras: growth, regulation, and non-intervention. I will examine the main features of each era and present a chronology of select oil industry events and petroleum policy measures. Section Two will end with an evaluation of current petroleum policy in terms of sustainable development.

1. The Era of Industry Growth: 1859-1958

The U.S. oil industry began with the discovery of oil in Pennsylvania in 1859. At first, petroleum was sold mainly for use in lamps but a rapidly growing market for lubricants and fuel emerged in the early 1900s as the automobile entered mass production. John D. Rockefeller's Standard Oil trust controlled the industry by the late 1800s, although competitors developed following major oil discoveries in Texas, notably the Spindletop field struck in 1901. (Malone, 1989) Standard Oil was ordered to divest its U.S. subsidiaries in 1911 under the Sherman Anti-Trust Act. However, three of Standard Oil's spinoffs, Exxon, Mobil, and Chevron, retained their key status within the industry.

Those three companies, along with Shell, Gulf, Texaco, and British Petroleum, make up the "Seven Sisters" which have dominated the international oil industry virtually throughout its history. (Sampson, 1975)

Consumption and production of oil in the U.S. rose steadily during the early part of the century. The U.S. provided 80 percent of all Allied oil supplies during World War I and, following the war, there developed a new lifestyle based on cheap oil. Oil analyst Anthony Sampson notes that, "The right to travel cheaply, to have cheap electricity and cheap heating, became regarded as part of American democracy...." (Sampson, 1975) U.S. companies expanded, seeking to join Britain and France in their control of Middle East oil supplies. Until the 1950s, major oil companies exercised great authority over Middle East oil reserves under concession agreements with host countries. The companies could explore for and develop fields in return for relatively small royalty payments. The very low cost of crude oil from the Middle East and other countries, notably Venezuela, led the U.S. to become a net importer of oil by 1947. (Odell, 1983)

During the oil industry's first 100 years, it developed a peculiar relationship with the U.S. government. While the government was ostensibly in a position to exercise control over the industry through anti-trust and other types of legislation, it instead extended protection to the industry's investments through tax laws and foreign policy

choices and, what is more striking, delegated diplomatic authority in oil-producing countries "as far as possible to the companies, and [regarded] them as an autonomous kind of government." (Sampson, 1975) The oil companies' diplomatic authority was especially prevalent in the Middle East, where the U.S. government was unpopular because of its support for Israel. While oil industry interests and U.S. government policy were probably inextricably linked since World War I or earlier, the government did not undertake major efforts to regulate the industry during peacetime until the late 1950s.

2. The Era of Government Regulation: 1959-1979

The years 1959 through 1979 saw significant government efforts to regulate the price and supply of oil in the U.S. through import quotas and price control systems. By the late 1950s, increasing U.S. dependence on foreign oil, combined with political difficulties of the Cold War, led to concern over the security of the nation's oil supply. Fidel Castro's success in Cuba and the election of a left-wing government in Venezuela, which had threatened to nationalize that nation's oil reserves, were considered particularly threatening. (Jones, 1988) The government requested that oil companies voluntarily restrict imports but, because foreign crude was much cheaper than domestic oil, compliance was not widespread. Consequently, the Eisenhower

Administration introduced the Mandatory Oil Import Program in 1959, which restricted imported crude oil to a 12 percent share of the market. Canada and Mexico were excluded from the restrictions because their oil shipments were not considered to be at risk. (Odell, 1983) The quota system protected the market share of domestic oil producers and provided cash flow and incentive for them to increase their oil exploration efforts in the U.S. Major discoveries made in Alaska during the years the quotas were in effect (1959-1973) were brought into full production despite environmental and logistical problems that would have made them too expensive to compete with imported crude in the absence of quotas. (Jones, 1988) By the early 1970s, U.S. oil companies were having difficulty maintaining adequate reserves in the face of steadily growing demand, and increases in the price of foreign oil eliminated the cost differential between domestic and imported oil which had made the latter so attractive. The quota system was no longer seen as a protection for the domestic oil industry and was eliminated in the summer of 1973 although a small tariff remained in effect. (Jones, 1988)

The 1970s saw major upheavals in the oil industry. In October 1973, OPEC made its first unilateral price increase, raising the price of crude oil by 60 percent to $5.12 per barrel. Prices more than tripled to the $16/barrel level by year end. The Arab members of OPEC imposed an oil embargo on the U.S. from October 1973 through March 1974 in

retaliation for America's suport of Israel in the Arab-Israel War of 1973. (Jones, 1988) In addition, OPEC members nationalized their oil reserves during the mid-1970s, ending the royalty and profit-sharing systems that had been so lucrative for U.S. oil companies.

National price controls on oil preceded these events in the Middle East, having been imposed in August 1971 as part of the Nixon Administration's Economic Stabilization Program that placed ceilings on prices and wages of all manufactured and traded goods and services in an effort to combat inflation. (Eppen, 1975) Phase I of the progam froze oil prices through November 1971; Phase II allowed small annual price increases. In January 1973, voluntary ceilings took effect and the oil industry did not adhere to them closely. As prices rose sharply, the government reimposed mandatory price controls on the 24 largest oil companies. This created price discrepancies between the supplies of regulated and non-regulated companies. To remedy this problem, a "two-tier" pricing system was introduced in the summer of 1973. The two-tier system granted oil from newly developed wells a much higher price than oil from fields in production before the measures were introduced, creating an incentive for companies to step up their exploration and development programs. (Eppen, 1975)

OPEC's price hike and embargo led to oil shortages in some parts of the country and prompted Congress to pass a comprehensive program of oil price and distribution controls

known as the Emergency Petroleum Allocation Act (EPAA). The EPAA's pricing provisions closely resembled the two-tier system already in effect. The Act also introduced a complex regulatory structure that allocated crude oil and petroleum products among oil companies and refineries. (Eppen, 1975) OPEC's actions revived concern over the security of America's oil supply. The government sought to increase domestic production through measures such as the Trans-Alaskan Pipeline Authorization Act and to promote energy conservation through measures such as the Energy Policy and Conservation Act (EPCA) of 1975. The EPCA extended price controls through 1979, established a national stockpile of crude oil known as the Strategic Petroleum Reserve, and introduced some energy conservation measures which are discussed later in this paper. With some adjustments, the two-tier price control system remained in effect throughout the 1970s. Although the system was complex and expensive to implement, the two-tier price controls were maintained because they encouraged domestic oil exploration by offering higher prices for new production and helped prevent oil companies from reaping windfall profits from the dramatic increase in world oil prices. (Jones, 1988)

The regulatory mechanisms imposed on the oil industry during the 1960s and 1970s were essentially responses to threats to the security of America's oil supply. Import quotas were meant to reduce growing dependence on cheap oil from potentially unreliable countries by protecting the

market share of domestic oil companies and providing cash flow for domestic oil exploration. Comprehensive price control and production allocation systems, and conservation legislation were efforts to ensure that the U.S. would have adequate oil supplies in the wake of the OPEC embargo and sharply higher prices for crude oil. However, price control systems were not considered to be very effective and began to be phased-out during the late 1970s. (Eppen, 1975)

3. The Era of Non-Intervention: 1980-1991

The year 1980 marked the end of oil price controls and the beginning of a market-driven or non-intervention era of petroleum policy that still continues. Beginning in the early 1980s, petroleum refiners went from buying oil under long-term contracts with producers to buying delivery contracts in an international commodity market setting. (ODOE, 1991) The Bush Administration continues to favor the "free market" stance toward the oil industry that became well established during the Reagan Administration. In 1989, President Bush directed that a keystone of U.S. energy policy should be continued reliance on the market. "Wherever possible, markets should be allowed to determine prices, quantities, and technology choices...government action should be aimed at removing or overcoming barriers to efficient market operation." (USDOE, 1991) In fact, the current administration refused to participate in a June 1990

conference between OPEC ministers and representatives of oil-importing nations such as France, Norway, Britain, and Germany because it believed that such a dialogue represented interference with free-market mechanisms. (Ibrahim, 1991)

Nevertheless, many aspects of the non-intervention strategy distinguish it as a deliberate, if relatively subtle, policy. Compared to other countries, gasoline taxes are very low in the U.S. American drivers pay about $0.35 per gallon in taxes versus at least $1.00 in most other oil-importing countries and as high as $3.30 in Italy. (Easterbrook, 1991) According to DOE, "This relatively low fuel cost has dampened consumer interest in more fuel-efficient vehicles...." (USDOE, 1991) In addition, if relatively cheap gasoline does not actually encourage people to drive more, it probably does not promote the use of alternative means of transportation.

The government provides subsidies to all the energy industries in the form of tax breaks, program outlays for energy agencies, and low-interest loans. Daniel Yergin's recent book The Prize documents the long history of favorable tax treatment enjoyed by the oil industry. In 1984, analysts at the Rocky Mountain Institute research center calculated that the oil industry received about $9 billion in subsidies, second only to nuclear power with $16 billion. (Sierra, 1991) These figures show that the government prefers to direct money toward the oil industry rather than renewable energy sources (e.g., solar power,

hydroelectricity), which received only about $4 billion. In 1990, Congress adopted several new tax incentives proposed by President Bush to encourage domestic oil exploration and development, and deployment of enhanced oil recovery technology. (USDOE, 1991)

The National Energy Strategy (NES) released by DOE in February 1991 is another indication of government policy, although its recommendations have not all been approved by Congress as of this writing. Perhaps the most striking feature of the NES is its emphasis on energy production and its omission of conservation measures. The NES originally proposed efficiency and conservation measures such as higher fuel taxes and tougher gasoline mileage standards for cars, but the Bush Administration's chief of staff, chief economic advisor, and budget director threatened to freeze the entire document unless those proposals were removed. The top economic aides denounced the conservation measures as "unacceptable government interference into free markets." (Rankin, 1990) The oil-related section of the NES focuses on increasing the supply of domestic oil, chiefly through opening 1.5 million acres of Alaska's Arctic National Wildlife Refuge for drilling, drilling in the Outer Continental Shelf off the West Coast when leasing deferrals expire in 2000, developing oil fields on Alaska's North Slope, and encouraging advanced oil recovery technology to prolong output from existing wells. The NES contains no new

regulations, incentives, or taxes to promote oil conservation or efficiency. (USDOE, 1991)

Ironically, in an era of professed non-intervention policy, recent U.S. military action against Iraq may represent the most significant government intervention in the oil industry ever undertaken. Soon after Iraq seized Kuwait in 1990, giving it effective control of about 20 percent of the world's known oil reserves, President Bush announced, "Our jobs, our way of life, our own freedom...will suffer if control of the world's great oil reserves falls into the hands of Saddam Hussein." (Wald, 11/12/90) In 1990, the U.S, imported about 42 percent of the oil it consumed and about 28 percent of those imports came from the Persian Gulf. The U.S. is expected to import about 65 percent of its oil by 2010 and, according to DOE, America's reliance on the Middle East as a source of supply will grow. (USDOE, 1991) Although the government officially cited several reasons for going to war against Iraq, stressing that nation's illegitimate aggression against Kuwait, it is very likely that protecting U.S. access to Middle East oil was a significant incentive.

4. Chronology of Select U.S. Petroleum Industry Events and Policy

I compiled the following table using the energy-related books, articles, and other publications listed in the Bibliography.

CHRONOLOGY OF SELECT U.S. PETROLEUM INDUSTRY EVENTS/POLICY

Year	Oil Industry Events	U.S. Policy Actions
1859	Oil discovered in Pennsylvania	
1883	John D. Rockefeller establishes Standard Oil	
1901	Oil struck at Spindletop, Texas	
1908	Oil discovered in Iran	
1911		Standard Oil ordered to divest subsidiaries under Sherman Anti-Trust Act of 1890
1939	Saudi Arabian production comes on line	
1947	U.S. becomes net importer of oil	
1950	Western oil companies shift from paying small royalties to Middle East countries to dividing profits with them. By late 1970s, Middle East countries directly control their oil reserves.	
1959		Mandatory Oil Import Program establishes quotas for oil imports
1960	OPEC founded	
1967	Oil discovered in Alaska	

Year	Oil Industry Events	U.S. Policy Actions
1969	About 5,595 barrels of crude spill off California coast	Drilling lease regulations tightened. Offshore operators made liable for cleaning spills
1971		Economic Stabilization Program imposes price controls on oil as part of wage/price controls on all goods & services to combat inflation
1973	OPEC makes its first unilateral price increase, raising price of crude 60% to $5.12/barrel. Price hits $16/barrel by year end. Arab OPEC members impose oil embargo on U.S. (through March 1974)	Emergency Petroleum Allocation Act sets up two-tier pricing system that distinguishes between old and new oil production. Act also allocates crude oil and petroleum products among companies. Trans-Alaskan Pipeline Authorization Act passed U.S. oil companies granted anti-trust waiver to participate in strategy talks with oil-producing nations
1974	U.S. oil consumption drops for the first time	
1975		Energy Policy and Conservation Act extends price controls through 1979, sets up Strategic Petroleum Reserve, sets minimum fuel economy standards for cars at 27.5 miles per gallon
1978		Cabinet-level Department of Energy established
1979	Shah of Iran deposed. Crude prices hit $40/barrel.	

Year	Oil Industry Events	U.S. Policy Actions
1980		Oil prices deregulated
		Crude Oil Windfall Profits Tax Act passed
1985	Saudi Arabia abandons attempt to stabilize oil prices by curtailing its production	
1986	Crude oil prices plunge from 1985 level of about $28/barrel to about $10/barrel	
1989	U.S. car population tops 143 million	
	Exxon tanker spills 250,000 barrels of crude oil into Alaska's Prince William Sound	
1990	Iraq invades Kuwait, giving it control of about 20% of known world oil reserves	Oil Pollution Act establishes oil-spill prevention, response, and liability program
		Congress plans to expand Strategic Petroleum Reserve to 1 billion barrels
		Clean Air Act amendments call for cleaner-burning gasoline and less automotive emissions
1991		U.S. military takes lead in driving Iraq out of Kuwait
		National Energy Strategy released

III Evaluation of Policy

Virtually all sustainable development strategies would greatly reduce and probably eventually eliminate the use of petroleum because it is a finite resource, making economies that depend upon it vulnerable, and because it contributes to pollution and possible global warming. I will evaluate current U.S. oil policy in terms of the two versions of sustainable development discussed at the end of Section One.

1. Economic Sustainable Development

The distinguishing feature of sustainable development that emphasizes economic considerations is the internalization of the environmental costs of production and resource use through market adjustments such as tax incentives or fees. Current tax structures encourage petroleum use by keeping consumer gasoline prices low and by stimulating the exploration and development of oil fields. The oil industry also receives relatively generous government subsidies.

The likelihood of the government changing the tax structure to discourage the use of petroleum or to raise revenue to mitigate the adverse environmental effects of petroleum use can perhaps be gauged by the defeat in Congress in 1990 of a bill to raise the federal gasoline tax and by the National Energy Strategy's comments on a proposed

carbon dioxide tax. Some economists feel that the worst external cost of fossil fuel may prove to be global warming, and that taxing CO2, the principle greenhouse gas, would prompt industry and motorists to reduce emissions. The NES rejected the idea of a carbon tax, using a rate of $135 per ton in its analysis, saying that such a measure would reduce CO2 emissions by 10 percent by the year 2000 but at an expense of a 1.2 percent reduction in GNP, significant harm to the economy, and a decrease in the competitiveness of all U.S. industries that rely on fossil fuels. (USDOE, 1991) Other analysts estimate that a CO2 tax of $100/ton would cost the owner of an average car about $500 per year. (Easterbrook, 1991) The NES states that it will address the problem of greenhouse gases "by encouraging the development and deployment of new technologies and instituting constructive policies, without resorting to punitive measures or new taxes." (USDOE, 1991) The government does support research and development efforts and offer tax credits for alternative transportation fuels such as ethanol. However, it could take many years for oil prices to stabilize at levels high enough to make alternative fuels cost effective. It does not appear that current petroleum policy is dedicated to internalizing the environmental costs of oil use through market adjustments and is therefore inconsistent with my definition of economic sustainable development.

2. Environmental Sustainable Development

Although the Bush Administration refers to current petroleum policy as "the successful policy of market reliance," (USDOE, 1991) the government does not seem committed to using market adjustments such as taxes to remedy the problems associated with petroleum use. Since government policy does not meet the minimal requirements of "economic" sustainable development as I have defined it, current policy obviously does not fit into a comprehensive sustainable development strategy that emphasizes environmental preservation. Such a strategy would call for significant efforts to reduce petroleum consumption and eventually replace fossil fuels as much as possible with renewable energy that carries fewer environmental costs. The contents of the NES and recent military action that, if only as a side effect, reinforced the security of U.S. access to Middle East oil indicate that the government does not intend to phase-out petroleum use in the foreseeable future.

However, it is not accurate to imply that absolutely nothing is being done to protect the environment. The Oil Pollution Act of 1990 should minimize potential damage from oil spills by requiring most tankers and barges to have double hulls by 2015 and by establishing a comprehensive oil-spill preservation, response, and liability program. (USDOE, 1991) The 1990 amendments to the Clean Air Act call

for development of cleaner-burning gasoline by 1995 and for new cars that produce less tailpipe emissions by 1996. It may also require improved automobile inspection and maintenance programs in some areas. (Gold, 1990) Corporate Average Fuel Economy (CAFE) standards require that new car fleets obtain an average 27.5 miles per gallon. However, despite ongoing efforts in Congress to raise CAFE requirements, they remain at the same level as when they were introduced in the Energy Policy and Conservation Act of 1975. (ODOE, 1991)

The first year that U.S. oil consumption ever declined was in 1974 following OPEC's unilateral price hike in 1973, which drove oil prices from about $3/barrel to $16/barrel by the end of that year. The reduction in U.S. consumption, from 818,000 thousand metric tons in 1973 to 782,000 TMT in 1974, was primarily attributable to consumer "belt-tightening" or temporary conservation efforts triggered by sharply higher oil prices. (Jones, 1988) However, the government did initiate more long-term conservation measures such as CAFE standards and home weatherization programs. These and private-sector efforts successfully reduced the energy intensity of the economy or the amount of energy needed to produce a unit of GNP. DOE calculates that "in 1990 producing $1.00 worth of goods and services required 39 percent less oil and [natural] gas than was needed in 1973." (Wald, 6/18/91) Oil consumption in 1990 was approximately the same as in 1973. It should be noted that private

enterprise rather than government-funded research is credited with developing most of the product and design innovations that have cut energy use. (Easterbrook, 1991) However, the trend toward energy efficiency seems to be ending as most of the obvious and relatively inexpensive conservation measures have already been exploited. Some analysts believe that energy efficiency declined in 1990 as new cars grew less efficient and some energy-intensive industries revived. (Wald, 6/18/91)

While the government has taken some action to conserve energy and reduce the level of emissions caused by burning petroleum, it does not appear committed to the phasing-out of petroleum use called for by a sustainable development strategy dedicated to environmental protection. This lack of interest in an oil-free future may be best indicated by DOE's budget for research and development of renewable energy, which fell from $700 million in 1981 to $129 million in 1991. (Watkins, 1991)

3. Conclusion

While some policy mechanisms to address the environmental problems associated with petroleum use are in place, the magnitude of the potential risks associated with urban air pollution and global warming make it questionable whether these regulations and requirements (notably the amended Clean Air Act) are sufficient to protect the future

of the environment. The government shows little commitment to reducing the nation's relatively high consumption of oil. Current policy is directed at ensuring an abundant supply of petroleum and letting market prices determine when widespread oil substitution might occur. Current U.S. petroleum policy does not meet sustainable development criteria under any version of the concept and shows little indication of doing so in the near future.

IV Summary of Section Two

Petroleum policy is a good microcosm of U.S. government policy because oil plays a significant role in the economy and the average citizen's lifestyle. Essentially, three features of petroleum make it relevant to the topic of sustainable development. First, oil is a finite resource expected to last only 100 years at current rates of consumption. Oil prices are not expected to stabilize at levels high enough to economically justify widespread oil substitution for many years. Second, petroleum causes environmental damage in the form of oil spills, smog and related air-quality problems, and carbon dioxide emissions that have been linked to global warming. Third, American businesses, citizens, and military equipment all rely heavily on petroleum, giving oil and oil prices great influence over the national economy.

The U.S. petroleum industry and related policy can be roughly divided into three eras. During its first 100 years, the industry grew rapidly and developed a close relationship with the government, especially in foreign policy issues. From 1959 to 1979, the government imposed regulation upon the oil industry in the form of import quotas and price controls designed to protect the security of America's oil supply in the face of increasing U.S. dependence on imports from countries with potentially volatile political situations. In 1980, oil prices were deregulated and the current era of market-driven or non-intervention policy began. However, many aspects of current oil policy could be regarded as government intervention, including low gasoline taxes, generous subsidies to the oil industry, and the recent war against Iraq.

Current petroleum policy does not meet the requirements of sustainable development. Recent failed attempts to raise gasoline taxes, tax CO2 emissions, or offer more government funding to alternative fuel development projects indicate the the government is not attempting to internalize the environmental costs of petroleum use through market adjustments. Neither does the government appear committed to phasing-out the use of petroleum. The DOE expects oil use to increase in coming years. Some policy efforts have been made to promote energy efficiency, and the energy intensity of the economy has declined over the past 20 years. However, it is questionable whether current policy

measures will adequately protect the environment. Current policy focuses on providing abundant supplies of petroleum rather than on addressing the long-term economic and environmental costs of America's high level of oil consumption.

SECTION THREE: ANALYSIS OF THE RELATIONSHIP BETWEEN SUSTAINABLE DEVELOPMENT AND U.S. POLICY

I An Analysis

My examination of current U.S. petroleum policy indicates that America is not following a policy course in accordance with sustainable development, does not seem likely to adopt sustainable development objectives in the near future, and is apparently encouraging blatently unsustainable resource use. A sustainable development agenda that corresponded to the description of the concept outlined in Section One would likely set the following goals regarding petroleum use: a significant reduction in oil consumption to minimize the environmental problems associated with petroleum; a more equitable distribution of energy use at sustainable levels among industrialized and developing countries, which also points to greatly reduced U.S. consumption; an increase in efforts directed at developing clean, renewable alternatives to petroleum; and political decisions that cut oil consumption, internalize the environmental costs of unavoidable petroleum use, and facilitate widespread oil substitution.

Section Two showed that current U.S. petroleum policy bears little resemblence to the goals just described. Policy efforts are directed at providing an adequate supply of oil rather than at reducing consumption or offsetting the

environmental problems associated with petroleum use. Tax mechanisms encourage the exploration and development of new oil fields, development of new oil extraction technology, and the use of gasoline. The government spends far more money subsidizing the oil industry and protecting U.S. access to Middle East oil than it does financing development of alternative or renewable energy sources. The current administration advocates allowing market prices to determine how much petroleum is used and when widespread fuel switching might occur.

This apparent disregard of the concept of sustainability seems rather strange, considering that exhaustion of the world's oil supply could occur within the foreseeable future. Known oil reserves are expected to last for 50 years at current consumption rates, with new oil discoveries expected to extend that deadline by only 50 more years. (ODOE, 1991) The United Nations' Intergovernmental Panel on Climate Change calculated that 100 more years of oil use at current rates would contribute to a five-degree increase in the global mean temperature by the end of the next century. (IPCC, 1990) While current consumption rates would lead to ecological problems and the rapid depletion of oil reserves, the level of U.S. petroleum consumption is not expected to remain constant but to rise. The National Energy Strategy offered 14 estimates of future oil consumption from 12 organizations. (USDOE, 1991) The estimates all predicted a higher level of consumption over

the next 20 years, with the increase ranging from approximately six to 30 percent over the 1990 level of about 17 million barrels per day. At best, the proposals in the NES would only cut primary energy demand by nine percent over projected growth by the year 2010. (Easterbrook, 1991)

I would like to consider some explanations for America's failure to pursue a policy course that accords with the concept of sustainable development, recognizing that a combination of factors rather than a single cause is probably responsible. Because sustainable development as an integrated plan for global survival is still a relatively new and ill-defined concept that is probably unfamiliar to many legislators and the general public, it seems unreasonable to ask why policy does not meet all the requirements of sustainable development as set forth by the WCED or others that have made a special study of it. However, it does seem reasonable to ask why policy is not designed to achieve even the basic common-sense goals underlying the idea of sustainable development, namely, a prudent use of natural resources (especially finite resources), a cautious stance toward actions that threaten the integrity of the environment, consumption patterns that are not wasteful, and planning to ensure that future generations inherit a healthy environment. I will first describe some attributes of the American government's structure and decision-making process that play a significant role in determining national policy. I will

then offer some additional theories to explain the discrepancy between sustainable development and U.S. policy.

1. Political Considerations

Interest groups that represent industries or other social factions have a significant effect on the shape of U.S. policy. Interest groups influence legislators through lobbying and control of information and expertise needed to write laws. They can also shape public opinion through media efforts and challenge legislative decisions in court, among other things. Interest groups representing large companies, such as members of the oil industry, have certain advantages over groups advocating environmental protection goals, such as energy conservation. Major companies usually have vastly greater resources and expertise with which to influence government. For example, Mobil Corporation's 1990 gross revenues totaled approximately $64 billion. (Mobil, 1991) According to oil industry analyst Peter Ellis Jones, Shell has private telecommunications and economic intelligence networks and government relations advisors that make it "probably comparable or superior to the diplomatic services of all but the top few international powers." (Jones, 1988) A legislator may also be sympathetically predisposed toward oil interest groups if his or her state's economy relies on oil production or energy-intensive industries. Interest groups that represent businesses do

not have to spend time and resources attracting and maintaining their membership, which gives them an advantage over ideological groups. Environmental groups also suffer from the free rider problem. Because environmental groups seek benefits that cannot be reasonably withheld from anyone, such as improved air quality, there is an incentive for "the rational individual [to] allow others to assume the organizational burden and wait to reap the collective benefits." (Schlozman, 1986) This means that many people in favor of environmental protection may not actively support environmental interest groups. Although the goals of environmental groups may have much broader public support than the goals of oil companies, the free rider problem and other disadvantages just mentioned make it difficult for environmental interest groups to influence government policy to the same degree as the oil lobby.

Political decisions also reflect a short-term orientation that does not favor sustainable development efforts. A legislator may hesitate to sponsor measures that will bring benefits in the distant future at the cost of sacrifices that will be felt by the public during that legislator's career. In fact, legislators have a strong incentive to select policies that allow them to confer immediate benefits through the imposition of costs some time in the future. It is also more politically expedient for legislators to favor measures that have clear beneficiaries. Policy makers cannot expect to gain support through

legislation if those it benefits do not realize that they have been favored or if its benefits are minimal and widely dispersed. Both the short-term orientation of political decisions and the political expediency of conferring clearly recognized benefits tend to work against sustainable development with its orientation toward the future and humanity as a whole.

The decision-making process has a strong tendency to favor incrementalism or gradual change. It would be too costly and time consuming to amass all the information needed to make each decision according to a scientific model of rational determination, assuming all the necessary information was available. Therefore, new policy measures tend to be adaptations of existing measures or remedial reponses to crises. For example, the Emergency Petroleum Allocation Act based its oil price controls on the pricing system already in place, and the Oil Pollution Act of 1990's comprehensive oil spill prevention measures came after the Exxon Valdez disaster. There is also a vital and intricate momentum to the routine of daily life that is antithetical to the imposition of comprehensive plans of reform. Changes are ususally mild and phased-in gradually to not significantly disrupt the country's daily operations. These factors are additional obstacles to sustainable development, which calls for new institutions and laws that would have a major impact on lifestyles.

The allocation of power within the American political

system also has implications for sustainable development. When writing the Constitution, James Madison deliberately divided power among the branches of government and encouraged the existence of a plurality of groups favoring different interests in order to prevent any single faction from seizing control of the government. (Rossiter, 1961) Although power is often concentrated in a few hands, it is not really centralized enough to overcome all the opposition that might arise against a comprehensive policy agenda that entailed major changes in business practices and the public's lifestyle. Energy conservation suffered recently both because power is concentrated, as when the Bush Adminstration's top three economic advisors forced the removal of conservation measures from the NES, and because power is dispersed, as when measures to raise CAFE standards and gasoline taxes failed to muster sufficient support in Congress. Due to the power structure of the political system, even fairly widespread support of sustainable development measures among government players or support by powerful key figures does not guarantee that the measures will be adopted.

In summary, America's political system is characterized by interest group influence, a short-term orientation, incrementalism, and an uneven allocation of power. These factors definitely influence the shape of policy. However, I do not think that they are the only factors involved. To place the responsibility for policy completely with

politicians, interest groups, and the nature of the political process may exonerate the average citizen from blame for policy that displays shortsightedness, but it virtually eliminates the average citizen from a political system premised on the idea of democratic participation. The public is partially responsible for policy, if only through mute compliance with it. I believe that at least three factors apart from the American government's structure and decision-making process account for the virtual absence of sustainable development measures in U.S. policy. These factors are widespread political inaction among citizens, negative perceptions of sustainable development, and a similarity between the intentions underlying sustainable development and many of the problems it seeks to solve. I will expand on these points separately.

2. Political Inaction Among Citizens

I do not think that policy embodying sustainable development strategies will be adopted unless the general public clearly demonstrates support for such measures. Business interests would probably oppose sustainable development efforts to protect the environment and discipline resource consumption because those efforts would jeopardize their profitability or threaten their very existence. Since businesses tend to have a strong influence on government due to their lobbying advantages, they would

probably succeed in quashing sustainable development measures or amending such measures out of recognition in the absence of determined opposition. This opposition might come from environmental interest groups, whose political influence has grown significantly in recent years. (Berry, 1977) In fact, one way the public could demonstrate its support for sustainable development would be to join such groups. However, without more members and resources, I do not think environmental interest groups could establish a new political paradigm such as sustainable development that differs so fundamentally from current policy and would meet powerful opposition from the business sector. Assuming that a broad segment of the public agreed with the idea of sustainable development, there would remain the problem of widespread political inaction. It seems common for a desire for political change to co-exist with an overriding disinclination to do anything about it.

Apathy is the purest cause of political inaction, that is, a desire to affect policy is not undermined by a sense of futility or cynicism in an apathetic person -- he or she simply does not care. It might seem that such people are completely dissociated from policy. However, in a sense they do participate in the political process because they obey the laws that policy comprises. Pure apathy is probably less common than a sense that individual attempts to influence government activity are futile. As communities and government institutions have grown larger and more

impersonal, the conviction that the political system is too large or too self-contained to respond to personal efforts has probably become more prevalent. A respondent to a 1990 New York Times/CBS News poll expressed this attitude when discussing her concern about the environment. "No one has been able to stop the polluting. I don't think my vote is going to stop them. It's too big for me." (Toner, 1990) Other participants in the poll also voiced feelings of alienation and a sense that their ballot would make little difference on the issues they cared about. This feeling is apparently widespread, with non-voters representing the real majority in most elections. In 1986, only 36 percent of the voting-age public went to the polls. (Toner, 1990) Regardless of whether voting does influence policy, that so few people even make the gestures of political participation supports the idea that passive acceptance of policy is the dominant political attitude in America. Another cause of this passivity is cynicism or a belief that the government is too corrupt to seriously consider alternative viewpoints.

Attitudes of apathy, alienation, and cynicism may be rational responses to the reality of government. It is hard to imagine that one's vote, donation to an interest group, or letter to a member of Congress will have an impact on policy. Even relatively direct access to policy makers does not guarantee that one will have any influence. For example, although the DOE held 18 public hearings around the country and heard energy policy suggestions from 448

witnesses when preparing the National Energy Strategy, three Bush aides removed the energy conservation measures from the final document. Exposure of wrong doing within the government, such as the Iran/Contra incident, supports the idea that following accepted procedures for participating in the political process may be pointless because people in power do not adhere to identifiable rules with consistency. While widespread political inaction may have well-justified causes, one of its results may be policy that encourages unsustainable resource use since only those groups interested in using resources feel compelled to participate aggressively in the political process. The sustainable development movement will probably need broad public support to counter opposition from the business and other sectors. The general public's political inaction bodes ill for adoption of sustainable development measures and may partly explain their absence from current policy.

3. Differing Perceptions of Sustainable Development

Perceptions of sustainable development may vary greatly and, when negative, be used to discredit the concept. Current definitions of sustainable development tend to share at least four goals: environmental protection, more equitable and sustainable resource consumption levels, environmentally benign technology, and an integration of environmental and economic considerations in policy.

Enactment of a sustainable development agenda would require the delineation of specific procedures for achieveing these goals. Creation of a detailed sustainable development plan might be such a contentious process, with many groups seeking to achieve goals that conflict, that consensus is never reached. Different interests and politicians may claim the appealing catchphrase and use it so many different ways that the concept of sustainable development loses meaning and credibility. Whether one or many versions of the concept becomes widely known, sustainable development will probably be subject to one or many of the negative interpretations described below.

One view might be based on the stance taken by cornucopians, namely, that the outlook for society and the environment is not particularly grim. Proponents of this view could note that past predictions of resource exhaustion and ecological doom have not materialized (Passell, 1990) and that, relative to many countries, the U.S. has a healthy environment and tough environmental regulations. Because problems such as acid rain and species extinction are not readily observable by most citizens, the simple fact that "things look okay" lends credence to the perspective that sustainable development is a proposed solution for a problem that is not really serious or does not exist at all.

Another interpretation involves the often uncertain or conflicting nature of scientific information. It might be allowed that potentially dangerous environmental problems do

exist but that scientific data are not complete enough to justify initiating major corrective schemes. Advocates of this view could note that predictions of global warming differ, depending on the type of computer modeling program used, and that some scientists believe that the reactions of plants, clouds, and oceans to increased CO2 levels could offset global temperature increases significantly. (USDOE, 1991) Given such uncertainty about the magnitude and effects of environmental problems, it could be argued that the wisest course is to conduct more research before implementing policy measures. This view casts sustainable development in the role of premature action.

Sustainable development could be portrayed as a serious threat to the nation's economy and, by extension, an attack on the average person's standard of living. This type of reasoning underlies the Bush Adminstration's argument that cutting U.S. emissions of carbon dioxide by 20 percent would be infeasible because it would cost $200 billion per year in capital investment. (Easterbrook, 1991) Under this view, sustainable development plans are not merely unnecessary or premature, but a menace.

The concept could also be seen as a duplicitous device to amass support by groups whose motives differ from those they profess. Because sustainable development calls for cooperation on a global level and a redistribution of resources, especially among industrialized and developing nations, the concept could be perceived as an attempt to

undermine national sovereignty in favor of a centralized world government or as a ploy to subsidize private interests in the Third World. Sustainable development could also be depicted as an attempt by the government to appropriate powers now held by the market or to take complete control of all the nation's natural resources. Any of these political/economic interpretations would cast sustainable development in a negative light and undermine support for the concept.

Sustainable development could be viewed as a mechanism to forestall the rigorous environmental preservation efforts that some environmentalists think are necessary through ratification of measures that claim to protect the environment but are, in fact, inadequate. Under this view, sustainable development is a plan that uses rhetoric and symbolic political gestures to establish legislation that actually secures the dominance of groups that believe development and economic considerations should determine policy. Given growing concern about environmental issues, this view could alienate a significant number of people from sustainable development.

Finally, sustainable development could be represented as a utopian dream of creating a perfect society, a sort of perpetual motion machine, or some other improbable achievement. Even optimistic humanitarians must feel skepticism at the thought of human society in its current or a similar form enduring ad infinitum. Sustainable

development cannot achieve legitimacy if it is equated in the public mind with fantastic idealism.

The success of sustainable development depends not only on its policy recommendations but on how the concept is perceived. Sustainable development may be trivialized if it is used in different ways by different groups. It may also be perceived as a solution to problems that do not exist, proposals based on inadequate scientific information, a threat to America's standard of living, a front for groups seeking to maintain power or wealth, an attempt to forestall serious environmental protection, or a plan for an inherently impossible society. To varying degrees, these perceptions may account for the discrepancies between sustainable development and current policy.

4. The Paradox of Sustainable Development

Another reason that U.S. policy does not reflect sustainable development measures may involve a similarity between the intentions underlying sustainable development and the intentions underlying many of the problems that sustainable development seeks to solve, such as over-population and environmental degradation. The most important shared value of sustainable development and the problems it faces is that the continued existence of the human race is desirable. Sustainable development's primary goal is to meet the needs of the present generation while

sustaining a healthy environment for future generations. This goal implies that human beings are of value and that the ability to meet human needs for such things as food and shelter within a healthy environment is important, being central to human existence. These two value assumptions, that human life is of value and that meeting the material needs of humans is important, underlie sustainable development. It would seem logical for the problems that sustainable development seeks to remedy to be based on different values. However, there seems to be a paradoxical aspect to sustainable development in that the problems and proposed cure are based on the same values. I will attempt to verify this claim by examining the roots of over-population and environmental degradation, two of the most challenging problems facing sustainable development efforts.

Aided by improvements in agriculture and medicine that have helped more than double the average life span in some countries over the past 200 years (Simon, 1989), the world's population has been increasing. Global population, measured at 2.5 billion in 1950, is expected to reach 8.2 billion by 2025. (WCED, 1987) What level of population constitutes over-population is a relative determination, probably hinging on the quality of life available to people in a given area. For example, a nation might be considered over-populated if it cannot grow, buy, or beg enough food to prevent widespread starvation among its people. Over-population might also be gauged by the amount of stress an

individual in a given nation exerts on the environment. For example, relatively few Americans might be viewed as a case of over-population because the average American contributes so excessively to global warming, producing 19 times as much carbon dioxide as the average citizen of India. (Passell, 1990) It might be argued that the world will never become over-populated because a truly high concentration of people would inevitably be checked by famine or war. Nevertheless, over-population is commonly considered a problem because it threatens the quality of life by pressuring limited resources and endangering the stability of social systems.

The average family size tends to vary by society, for different reasons. The degree of control that women have over their lives, and the availability of and attitudes toward birth control play a role. However, a nation's level of industrialization seems to be the most predictable indicator of family size. (WCED, 1987) Families tend to be smaller in industrialized countries than in less-developed countries, where children often help support the household from an early age and provide for relatives that have grown too old to work. It might be argued that raising the standard of living in the Third World would eliminate the economic incentive to have many children and thus solve the population problem. However, raising the per capita standard of living would also raise the degree of stress that each individual places on the environment, so that a lower number of people would still constitute over-

population.

Assuming that over-population is considered a serious problem in a country, one might ask why the government does not administer mandatory sterilization or abortions, citing its action as an efficient means of sparing children the suffering of poverty and of benefiting the entire population by decreasing the demands on resources. The country that has come closest to such a policy is China, which mandated in 1979 that families could only have one or two children or face severe punishments. However, it appears that parents often evade the penalties by giving up babies for informal adoption, sending children to be raised by relatives in other areas, or managing to avoid registering the infants at birth. (Kristof, 1991) I think it is extremely unlikely that many nations would accept a policy similar to or harsher than China's for a reason that may lie at the heart of the question of population. I think most people find a profound source of meaning in children and would violently resist forcible attempts to prevent them from having children. Most societies seem to acknowledge a sacred aspect to human life. If human life is considered to have a sacred value, then children especially partake of this inviolableness because they represent the renewal and perpetuation of human life. This belief that human life has value contributes to the problem of over-population and is at the same time one of the fundamental premises of sustainable development.

Another serious problem facing sustainable development is environmental degradation such as resource depletion and pollution. It would probably be easier to solve this problem if those responsible for ecological damage were motivated solely by greed and a desire for profit, and if their actions had only deleterious consequences. However, most environmental damage does not stem from pure greed or a wanton desire for destruction, but from efforts to provide people with the material things and sources of energy that they need to live comfortable or at least tolerable lives.

I do not mean to imply that businesses and industries are altruistic or blameless. While it is clear that activities such as mining and lumbering provide jobs and materials to improve people's standard of living, it is equally clear that these pursuits could be conducted in more environmentally sound ways. Deliberate discharges of pollutants into the air or water are particularly hard to excuse and probably do result from a desire to keep as low as possible all costs that might affect a company's profits and the consumer's pocketbook. However, I do not think it is realistic to say that the chief executive officers of businesses care only about profit. By itself, profit is merely a figure to be compared with other figures on a financial statement. A person who cared for nothing but the difference between two numbers would be insane. The success of a business ultimately depends upon the performance of its employees and the quality of its goods or services. The

head of a business must care, to some degree, about the satisfaction of the company's employees and customers. Even if a business only considers its employees and products as means to achieving the end of making a profit, jobs and quality goods are a benefit to society. The making of a profit and the creation of some kind of benefit to society or some segment of society are rarely, if ever, separable. Behind much of the development that has buried the land and the harm inflicted on the environment lie jobs and products designed to make human life better, at least from a material point of view. The beneficial consequences of development and resource use imply a desire to improve human existence, which is also the intention underlying sustainable development.

While over-population and environmental destruction threaten human existence, the intentions and values that give rise to these problems are not necessarily misanthropic. In fact, I think these problems largely stem from a respect for human life and a desire to make human life better, which are the same goals underlying sustainable development. This similarity of intention between sustainable development and the problems it seeks to solve may indicate that sustainable development is not the solution that its advocates claim it to be and may account for its absence in policy.

II Conclusion

In this paper, I presented a general picture of sustainable development, compared it with U.S. petroleum policy, and considered what factors might explain the difference in orientation between the two. The dominant causes of the discrepancy are probably attributes of the American political system; specifically, the influence of business interest groups, the short-term orientation of decision makers, incrementalism, and the uneven allocation of power within the government. However, assigning complete responsibility for policy to political players and processes is simplistic and deprives the public of any meaningful involvement in government. I proposed three additional factors to account for the absence of sustainable development measures in U.S. policy. The first was political inaction among citizens. I suspect that a large percentage of Americans favor the ideas represented by sustainable development. However, because a large percentage of the public does not vote or otherwise signal its interest in policy, the government does not register what may be the prevalent attitude of the country. Because the traditionally influential business lobby groups would not benefit by tougher environmental laws and other changes entailed by sustainable development, other types of interest groups and the public must support the movement if it is to succeed. I do not think that policy lacks sustainable

development measures because the political process excludes average citizens who favor the goals of sustainable development. Rather, citizens decide, one by one, that they would rather not bother participating. My second point involved negative interpretations of sustainable development. The concept may become trivialized by being used in too many ways or it may be perceived by decision makers and the public as unnecessary, premature, detrimental, or idealistic. While such views may or may not reflect an understanding of the concept, they may explain why sustainable development is still a proposal, not a reality. Finally, I proposed that sustainable development's lack of success may stem from the ambiguity between solution and problem that becomes apparent upon an examination of the values underlying sustainable development and such problems as over-population and environmental degradation. At the root of sustainable development and many of the problems it seeks to solve lies a belief that human life is worthy of respect and preservation. This similarity of fundamental principle makes it difficult to neatly oppose sustainable development to various problems and propose it as a clear-cut cure. I think the three factors described above, in addition to political considerations, help account for the absence of sustainable development elements in U.S. policy.

Of course, the problem remains of trying to shape the future of a planet whose human population and environmental problems will probably continue to grow and become more

complex. Whether the current generation has a moral obligation to try and ensure that its descendants will inherit a healthy world is a question that sustainable development does not answer directly although it implies that such an obligation exists. The specifics of sustainable development are not couched in moral terms. Sustainable development does not call for the protection of plant and animal species because it is "right" to respect the existence of non-human forms of life nor does it advocate redistributing resources because it is "unjust" for some people to starve while other diet. Instead, sustainable development claims that such actions are in the self-interest of each nation to ensure the survival of all. (Gallopin, 1989) Yet, in a larger sense, sustainable development does aim to preserve the stable social and environmental systems that permit morality to exist. Sustainable development seeks to preclude the degeneration of civilization into an undisguised tooth-and-nail struggle for survival in which ethical concepts are thrust aside. As Hans Jonas writes,

> "Once the situation becomes desparate, then what there is to do for salvaging it must be done, so that there be life - which "then," after the storm has been weathered, can again be adorned by ethical conduct. The moral inference to be drawn from this lurid eventuality of a moral pause is that we must never allow a lifeboat situation for humanity to arise." (Jonas, 1979)

It is hard to argue against preventing a breakdown of social and moral systems, which are delicately anchored as it is. Sustainable development deserves support if it could preserve or improve the world's social fabric and environment.

Unfortunately, it is not certain that sustainable development would be successful. The concept does not yet represent policy recommendations specific enough to be considered for implementation by real-world bureaucracies and institutions. This imprecision of definition helps give rise to the various interpretations of the concept discussed earlier. Sustainable development does seem to imply increased government control over business, the environment, and the average person's lifestyle, which will probably not inspire enthusiasm in the U.S., with its antipathy toward big government. (Huntington, 1981) Such suspicion of far-reaching, centralized government power may be well justified.

Sustainable development represents an intensification of the basic socializing process in which people relinquish options for individual action in order to sustain a group structure. By means of this process, humanity has gone from living within kinship clans to dwelling peacefully amid complete strangers. Sustainable development would extend this state of dubious community to a much larger scale, asking the individual to assume responsibility through his or her behavior for people in other nations and those yet

unborn. While compliance with the demands of sustainable development in the name of humanity might be a noble thing, it might also weaken certain aspects of character ususally listed among humanity's better attributes, such as independence, originality, and daring. A person's experiences often shape his or her character, and the options for individual action might be severaly constricted under sustainable development. For example, environmental and population pressures might necessitate restrictions forbidding most people to own land or have children. It is not certain to me that a future in which social control grows more and more pervasive is desirable. To preserve the human species no matter what the cost to its humanity would be a mistake.

Sustainable development does not have to be an oppressive regime that stunts the individual in the name of the species. However, specific sustainable development proposals should be considered carefully by decision makers and citizens to ensure that they do not manifest this tendency. Even if a comprehensive sustainable development agenda is not enacted, examination of the concept may encourage a more sincere commitment by government to give the environment fair consideration in policy. The public may realize more clearly that many of the products and processes that constitute the American standard of living actually detract from the quality of life by causing pollution and other forms of environmental damage. But

before sustainable development can even figure prominently in the national dialogue, the public must show more interest in affecting the content of policy, the definition and specific recommendations of sustainable development will have to be clarified, and a greater understanding of the values underlying the world's problems will have to come about.

Sustainable development may not be successful and, even if it is, may not significantly reduce human suffering or improve mankind's moral sense. Yet the concept is a worthwhile attempt to look seriously at the future. The world has shrunk during the past few centuries and recklessness of any kind seems to be increasing dangerous. The idea of sustainable development arose with humanity's maturity and has the sober, unavoidable aspect of an adult responsibility.

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